KILL VAN KULL-NEWARK BAY CHANNELS
PHASE II DEEPENING PROJECT
FINAL ENVIRONMENTAL ASESSMENT
DECEMBER 1997

1.0 INTRODUCTION

The New York District, Corps of Engineers is proposing the completion of the project authorized in the Supplemental Appropriations Act of 1985 for navigational improvements along the existing Federal navigation channels of the Kill Van Kull (KVK) and Newark Bay. The proposed work would complete the deepening of the channels to their authorized depth of -45 mean low water (MLW) . The proposed plans were analyzed in the Feasibility Report (1980), the Final Environmental Impact Statement (FEIS) (1980), the Supplemental Environmental Impact Statement (SEIS) (1986), the General Design Memorandum (GDM) (1986), and the Final Supplement to the Final Environmental Impact Statement (FSFEIS) (1987). These documents and the Record of Decision (ROD) (1987) are available in the District office for review. This Environmental Assessment (EA) provides an update of the analyses of potential environmental impacts contained in the above-referenced documentation to determine if there are substantial changes in the proposed action or significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts that would warrant the preparation of a new supplement to the FEIS. A tiered approach to disposal issues has been adopted in accordance with the Council on Environmental Quality, NEPA regulations 40 CFR 1502.20 and 1508.28 in which the final selection of a disposal site is deferred until this issue is ripe for decision. All appropriate NEPA and other regulatory compliance documents will be prepared prior to the selection of an upland disposal site for sediments not suitable for ocean disposal.

1.1 Proposed Action

The authorized project plan entails deepening of existing navigational channels from the confluence of the Kill Van Kull and Anchorage channels to the northern edge of the Port Newark Reach in Newark Bay (Station 168+22N) to -45 feet MLW plus an additional 2-foot allowance for safety clearance and maintenance to ensure project depth is achieved (Figure 1). This will approach or equal the depth of the Ambrose-Anchorage channel feeder arteries which connect the harbor with the Atlantic Ocean (USACE 1980). At this time, construction of the Port Newark Channel, Newark Pierhead Channel, and a portion of the Newark Bay Channel (Station 139+20N to Station 168+22N) has been deferred at the request of the non-federal sponsor (Port Authority of New York and New Jersey and/or State of New Jersey). This area was deferred by the non-federal sponsor because of the potential negative impacts which larger ships may have to the landing safety zone at Newark International Airport.

2.0 PURPOSE AND NEED

2.1 Marine Traffic and Safety Concerns

The existing Federal Navigation Channels in the Kill Van Kull and Newark Bay are presently at depths which do not provide for economically efficient and safe utilization of these channels by the deeper draft vessels with drafts greater than 40 feet. Vessels that transit these waterways generally dock along the southshore of the City of Bayonne, i.e. Global Terminal, and at Port Newark and the Elizabeth-Port Authority Marine Terminal. Consequently, container ships and oil tankers either transit these channels in a lightered or underloaded condition or anchor in New York Harbor to await a favorable tide. By underloading, vessels may vary their drafts in order to safely transit channels of various depths. Lighterage requirements cause markedly increased tanker occupancy at the deeper New York anchorages. The chronic condition of tanker overcrowding at the anchorages increases the probability of accidents. The extra handling of oil cargo associated with lightering (transferring of cargo to smaller vessels or barges), coupled with congested marine traffic elevates the probability of water pollution from spillage during these additional shipping/transfer operations.

2.2 Economic Concerns

In order for society as a whole to realize the greatest possible gains from trade, it is necessary for that trade to be carried from place to place in the most economically efficient manner. In the case of ocean-borne trade, it is indisputable that larger vessels offer economies of scale over smaller vessels, provided that there will be a sufficient volume of trade to avoid operating the larger vessels in an excessively light loaded condition. Therefore, a sufficient volume of trade is a necessary condition for society to realize (in the form of reduction in total transportation cost per unit) the economies of scale offered by modern ships. Another necessary condition for the realization of economies of scale in ocean-borne transportation is that those larger vessels be able to reach the facilities that carry out the loading and unloading of cargo and other servicing required by these vessels. Whenever both necessary conditions are present, society reaps a reward in the form of transportation costs avoided.

The Kill Van Kull Channel connects Upper New York Bay with Newark Bay and the Arthur Kill. In order for ocean going vessels to reach the facilities on Newark Bay or the facilities on the Arthur Kill to either discharge or load cargo, those vessels must transit the Kill Van Kull. For many types of ships, transiting the Kill Van Kull is a routine process. This is because those ships are not large enough to draw more water than the amount required for safe passage of the Kill Van Kull at its current depth of 40 feet. The Kill Van Kull, though, and consequently the cargo handling facilities on Newark Bay, are not accessible to many of the most modern container ships and tankers because their carrying capacity is so large that they have drafts in excess of the maximum safe operating depth of the Kill Van Kull. These are precisely the ships that offer the economies of scale that would allow society to reap the greatest possible rewards from trade. Moreover, there are no alternative facilities in the Port of New York and New Jersey that have either the necessary water depth or the cargo handling capacity to serve the ships in question. The facilities on Newark Bay lack only the required water depth. Therefore, the problem is that society at large cannot realize the full benefits of trade because the most economically efficient ships cannot utilize the Port of New York and New Jersey.

It is possible, as a purely technical matter, to solve this problem by making the Kill Van Kull channel deeper. The important questions, though, are what the extent of the resulting benefits

would be and what the full cost to society of such an undertaking would be. The project can be reaffirmed only if, over the assumed 50 year life of the project, its annualized total costs are less than its annualized total benefits. Reanalysis of contamination costs and project benefits for the Limited Reevaluation Report (LRR) and Final EA estimate that the annualized cost of deepening the Kill Van Kull to -45 feet MLW is approximately $148 million. The annualized benefits resulting from incurring this cost are estimated to be $615 million, thus indicating highly favorable economic viability. The sources of benefits are: (1) the reduction in unit total transportation costs made possible because the deepening will allow the realization of economies of scale through the use of a future fleet that reflects the current pattern of container ship construction; and (2) the increase in the volume of trade (and thus the number of units on which economies of scale are realized) that is the natural consequence of a U.S. economy that is assumed to continue to grow at approximately the same rate at which it has grown over the course of this century.

2.3 Commitment of Resources

The Kill Van Kull and Newark Bay channel project was authorized for construction in the Supplemental Appropriations Act for fiscal year 1985, Conference Report Stating:

> "...That the Secretary of the Army acting through the Chief of Engineers is authorized and directed to proceed with planning, design, engineering, and construction of the following projects substantially in accordance with the individual report describing such project as reflected in the Joint Explanatory Statement of the Committee of Conference accompanying the Conference Report for H.R. 2577...; Kill Van Kull Channel, Newark Bay Channel, New York and New Jersey..."

The report referenced in the Joint Explanatory Statement was the December 1981 report of the Chief of Engineers, who concurred with the views of the Board of Engineers for Rivers and Harbors (BERH). The BERH report generally agreed with the District's and Division Commander's Reports except that it recommended deepening to -45 feet MLW. Therefore, the depth to -45 feet MLW was authorized by the Supplemental Appropriations Act, 1985; Public Law 99 - 88.

The authorized improvement of existing Federal navigation channels for the Kill Van Kull and Newark Bay channels provides for the deepening of the Kill Van Kull and Newark Bay channels to -45 feet MLW. This EA updates the environmental analysis for this proposed action of completing construction.

3.0 BACKGROUND

The following project documents were prepared to address the feasibility of channel improvements in order to deepen the channels of the KVK and Newark Bay to facilitate commercial navigation and increase the level of safety with which commercial navigation is conducted: the U.S. Army Corps of Engineers (USACE), *Kill Van Kull and Newark Bay Channels Navigation Study on Improvements to Existing Federal Navigation Channels, Technical*

Appendices, July 1980; the USACE, *FEIS Disposal of Dredged Material from the Port of New York and New Jersey*, March 1983; the USACE, *Supplemental EIS Newark Bay/ Kill Van Kull Navigation Project*, February 1986; the USACE *GDM*, 1986; and the USACE, *Final Supplement to the Final EIS (FSFEIS) Newark Bay/Kill Van Kull Navigation Project*, January 1987.

The planning process for the KVK/Newark Bay Channel improvements fully evaluated the authorized plan against non-structural and structural measures and a no action alternative, as a means of achieving the project objectives or portions thereof. The evaluation of non-structural measures included: very large shallow draft vessels, high water transit, alternative delivery sites, alternative energy sources, and a U.S. Coast Guard vessel traffic system. They included measures that allow for greater unit vessel loading economies with less deepening of navigation channels; alternative sites for, or means of commerce delivery; alternate energy source replacement of petroleum cargoes; and traffic control/advice as a means of traffic management. Non-structural measures did not improve the available navigational channel area or channel depth.

Local users of these channels are responsible for deepening berths and access channels. The KVK/Newark Bay project has a potential for secondary impacts through actions of the project beneficiaries. The impacts for each project proposed by a local user would be evaluated through its own compliance with applicable permits and NEPA.

3.1 Structural Plan

The structural plan re-evaluated by this EA is the authorized plan which consists of deepening (and the widening and re-aligning of certain sections to maintain channel slopes) part of the KVK and Newark Bay channels to the maximum approved depth of -45 feet MLW. This depth will require an additional 2-foot allowance for safety clearance and maintenance. On the basis of reanalysis prepared for the LRR and Final EA, the estimated volume of material to be removed to achieve -47 feet MLW construction depth is 10.7 million cubic yards (mcy). In order to achieve the required depth it is reasonable to expect the contractor to remove additional material below elevation -47 MLW. It is estimated that additional volume which may be removed through over-dredging will not exceed 4.6 mcy. Because the dredged material removed from these depths are well below natural depth or past channel depths, it is anticipated that the majority of this material will be uncontaminated sediment and rock.

At this time, construction of the Port Newark Channel, Newark Pierhead Channel, and a portion of the Newark Bay Channel (Station 139+20N to Station 168+22N) has been deferred at the request of the non-federal sponsor. This segment of the project was included in the economic, engineering and environmental analyses, but is not being recommended for construction. The total volume of dredged material associated with this reach is estimated to be 1.7 mcy. This total volume is comprised of 480,000 cubic yards (cy) of material unsuitable for ocean disposal, 110,000 cy of rock and 1.14 mcy of material which may be suitable for remediation at the Historic Area Remediation Site (HARS). These estimates are based on the geologic boring data. Final characterization is dependent on results of appropriate ocean disposal testing and evaluation.

The estimated cost of constructing the federal channels is approximately $630 million. The total first cost of construction is estimated to be $890 million of which the federal cost is $621 million and non-federal cost is $269 million. The District is continuing to refine this estimate by evaluating the engineering and design effort, performing sediment characterization and testing studies and other technical studies. Subsequent to the implementation of the approved plan, the

channels will then approach or equal the depth of the Ambrose-Anchorage Channel feeder arteries which connect the harbor with the Atlantic Ocean (USACE 1980). It is currently estimated that construction of the authorized project will take approximately 10 years. Excluding the deferred portion of the project, construction is estimated to require approximately 9 years.

3.2 Tiering of Dredged Materials Disposal

Since the construction of Phase I of the KVK/Newark Bay Navigation Project, there has been considerable work to identify other disposal alternatives for materials found unsuitable for unrestricted ocean disposal. Recently, the Administration's announcement of the closure of the Mud Dump Site (July 24,1996)(Appendix B) has directed that the disposal of dredged materials at the Mud Dump Site be stopped on September 1,1997. Only material found suitable for unrestricted ocean disposal will be allowed to be so placed, for purposes of remediation. On the basis of reanalysis prepared for the LRR and Final EA, the District estimates that construction of the authorized project will require disposal of approximately 1.1 million cubic yards (mcy) of rock and 9.6 mcy of sediments. It is estimated that approximately 6.3 mcy of the sediments may be suitable for potential remediation at the HARS which is scheduled for designation on September 1, 1997 and which will include the area currently delineated at the Mud Dump Site. After closure of the Mud Dump Site, this HARS region will only accept clean material for the purpose of remediation. Estimates based on grain size and geological stratification as shown by borings data indicate that approximately 3.3 mcy of sediments may be unsuitable for ocean disposal (USACE 1997).

The District will coordinate with the U.S. Environmental Protection Agency (USEPA) and the Inter-Agency Sediment Testing Team (District, USEPA, and appropriate state agencies) to finalize a sampling and testing design which will evaluate the suitability of the material for ocean disposal. A thorough program of stratigraphic analysis, sediment testing, and inter-agency coordination will be undertaken to identify dredged materials from the KVK/Newark Bay Navigation Project, which will qualify for remediation at the HARS. Rock will be transported to construct or augment artificial reef sites, as deemed most appropriate by either state resource agency and NMFS. The construction of any new artificial reefs will be fully coordinated with the States of New York and New Jersey if the reefs are within State territorial waters and will be subject to all appropriate permitting requirements. As part of this compliance process, the District will coordinate with NMFS and other appropriate agencies including the Mid-Atlantic Fisheries Management Council.

The remainder of the material other than the rock is expected to contain measurable levels of contaminants. In 1986, the District completed a SEIS for the KVK/Newark Bay project with an extensive discussion of disposal strategies for these materials. These included borrow areas, capping of contaminated sites, containment islands, habitat/wetland creation, industrial fill, artificial reef, upland disposal, and sanitary landfill cover (FSEIS, Appendix G) (USACE 1986). Some of these strategies have also been evaluated elsewhere (Disposal of Dredged Material for the Port of New York and New Jersey, FEIS USACE 1983; Confined Disposal of Dredged Material, Engineer Manual, USACE 1987; and Use of Sub-Aqueous Borrow Pits for the Disposal of Dredged Material from the Port of New York and New Jersey, FEIS, USACE 1991). All current and potential disposal alternatives are under evaluation as part of the New York Harbor Dredged Material Management Plan (DMMP) (USACE 1996). The DMMP is a comprehensive, regional plan which is being developed for the Port of New York and New Jersey.

The DMMP process will develop a fully integrated regional plan for disposing of maintenance and new work dredged material through the middle of the next century, while seeking a balance

between economic development of the Port and environmental protection. The DMMP interim report (USACE 1996) presents the preliminary analysis of the technical feasibility including impacts of a variety of strategies, screened sites that would be suitable for application/construction, and conceptual cost and time frames to bring them on-line. The DMMP's analysis of disposal strategies includes: continued ocean placement; aquatic confined disposal facilities (containment islands, containment areas, sub-aqueous pits); upland disposal; short-term sites (where implementation can occur by the end of 1999); beneficial use of dredged material; decontamination of dredged material; sediment reduction/minimization methods; and applications of delivery systems. The continuing DMMP process will incorporate the findings and concerns of potential sponsors, as well as citizen and environmental groups. In-addition, the DMMP (USACE 1996) has identified other disposal opportunities which may become available during the life of the project. Sites selected as part of the KVK/Newark Bay Channel Deepening Project must show costs commensurate with suitable benefits, complete compliance requirements, and permitting.

Other sites may also become available outside the DMMP process as a result of private sector ventures. These sites could be used for disposal of dredged material from this project, providing they meet all appropriate NEPA and permitting requirements. One or a series of these options are likely to become available prior to or commensurate with the KVK/Newark Bay Channel Deepening project and, thus, provide the necessary capacity needed to undertake the project. If not, the strategy developed and implemented for the DMMP would be utilized.

Upland disposal testing requirements will be obtained directly from the state where the upland disposal site is located. The State of New Jersey is presently finalizing regulations and guidance which would apply to all candidate sites for reviewing dredging activities and the management of dredged material (The Management and Regulation of Dredging Activities and Dredged Material in New Jersey's Tidal Waters, NJDEP, Draft, March 1996). When selection of a specific upland disposal site is finalized, it will be subject to these criteria for required sampling, testing, and permitting of dredged material for various identified management alternatives, including potential beneficial use options. Application of these procedures will minimize the potential for adverse impacts to the environment and public health.

The identification of the dredged material disposal site for the KVK/Newark Bay material is the responsibility of the non-federal sponsor. During the preparation of this EA, selection of a specific disposal site for sediment which may not be suitable for ocean disposal has not yet been finalized. The USACE in coordination with non-federal partners has identified and integrated a number of disposal strategies into an overall management plan. Two upland disposal sites in the State of New Jersey, proposed by private entities, have been identified by the non-federal sponsor.

Therefore, for the purpose of this EA, a tiering strategy in accordance with the Council on Environmental Quality, NEPA regulations 40 CFR 1502.20 and 1508.28 has been adopted in which the final selection of a disposal site is deferred until this issue is ripe for decision. All appropriate regulatory and permitting requirements (including NEPA, U.S. Fish and Wildlife Coordination Act, the Endangered Species Act, National Historic Preservation Act, State Water Quality and Coastal Zone Management regulations and any other appropriate permits) for the actual disposal site or sites shall be met to ensure an opportunity for public review and comment prior to selection for this project.

3.2.1 Local Disposal Strategies

The first group of disposal alternatives consists of short term and local disposal opportunities.

Short Term Disposal Opportunities. These include nearshore containment sites, and landfill closure, as well as situations which may be comprised of combinations of aquatic and upland settings. Currently, the non-federal sponsor's candidate sites, the Seaboard/Kearny site, and the Bayonne Golf Course Project (Table 1), are of this type. Potential issues may include impacts to aquatic and terrestrial resources, threatened and endangered species, wetlands, cultural resources, potential site remediation, surface water and groundwater quality, Coastal Zone Management program issues, and locally permitted discharges and water dependency. Use of these locations for the KVK/Newark Bay Channel Deepening Project is contingent on completion of all permitting and NEPA compliance requirements and affordable costs.

Near Shore Disposal Alternatives. Sites along the local waterfront may become available for near shore disposal actions (Table 2). Dredged materials unsuitable for placement at an artificial reef or for remediation at the HARS could be used to create land adjacent to the existing shore. Construction of the near shore disposal facility and associated retention structures would require prior NEPA review as part of the federal review for the KVK/Newark Bay project or as part of a separate regulatory review examining a disposal facility.

TABLE 1

CANDIDATE SITES PROPOSED BY NON-FEDERAL SPONSOR

TYPE OF DISPOSAL	SITE	LOCATION	STATUS
Upland/Nearshore Confined Disposal Facility (CDF) Site Remediation	(Seaboard) - Kearny Koppers Coke (approx. >5 mcy*)	Kearny, NJ	Permit application expected in Apr/May 1997
Nearshore CDF/Landfill Closure	Bayonne Landfill Remediation/Golf Course (10-12 mcy)	Bayonne, NJ	Permit application received in Feb 1997; EIS will be required; process initiated Apr 1997

* mcy - million cubic yards

TABLE 2

DREDGED MATERIAL DISPOSAL - LOCAL SITES

TYPE OF DISPOSAL	SITE	LOCATION	STATUS
Near Shore Confined	River Terminal		Permit application under

Disposal Facility (CDF)	(approx. 0.25 mcy*)	Kearny, NJ	review; NEPA will be met under USACE Regulatory Program
Landfill Closure/Wetland Fill	Hackensack Meadowlands (1-3 mcy) Landfill Closure or use at approved permitted development site	Hackensack Meadowlands (Bergen & Hudson Counties)	One permit application under review; NEPA documentation required as part of USACE Regulatory Program
Landfill Closure	Bellemeade Site	Carteret, NJ	Permit application under review; NEPA will be met under USACE Regulatory Program
Subaqueous Pits	Newark Bay Confined Disposal Facility (NBCDF)	Port Newark, NJ	FEIS published Apr 1997

* mcy - million cubic yards

Upland Disposal Opportunities. Locations in Union and Hudson Counties, New Jersey have been cited as examples of upland disposal options (Table 2). In both settings, all necessary state permits would be required for the acceptance of dredged material as fill. If the sites involve impacts to waters or wetlands within the jurisdiction of the USACE, then federal NEPA compliance requirements would need to be met under the USACE regulatory program. If a disposal alternative becomes available for which impacts have not been addressed by a NEPA review process then the New York District will supplement this NEPA document. In settings where the dredged materials could be used to cap landfills, this disposal option would also constitute beneficial reuse.

Subaqueous Pits. The Newark Bay Confined Disposal facility is a potential subaqueous pit that could become available for use for the disposal of some material from the KVK Navigation Project (Table 2). A proposal to build a subaqueous confined disposal facility has been developed, and the NEPA review (FEIS, April 1997) and permitting process for a USACE permit is currently underway.

The USACE-New York District evaluated the use of new and existing sub-aqueous borrow pits and has determined that they are environmentally sound for dredged material deemed unsuitable for unrestricted ocean disposal (*Final Supplemental EIS, Sub-Aqueous Borrow Pits,* 1991; *Final EIS Newark Bay Confined Disposal Facility,* 1997). This determination is based on their long-term ability to isolate contaminants from the water column, minimal impacts to aquatic resources and human health, and their immediate availability and high probability of success.

3.2.2 Non-Local Disposal Strategies**Subaqueous Pits.** The Newark Bay Confined Disposal facility is a potential subaqueous pit that could become available for use for the disposal of some material from the KVK Navigation Project (Table 2). A proposal to build a subaqueous confined disposal facility has been developed, and the NEPA review (FEIS, April 1997) and permitting process for a USACE permit is currently underway. The USACE-New York District evaluated the use of new and existing sub-aqueous borrow pits and has determined that they are environmentally sound for dredged material deemed unsuitable for unrestricted ocean disposal (*Final Supplemental EIS, Sub-Aqueous Borrow Pits,* 1991; *Final EIS Newark Bay Confined Disposal Facility,* 1997). This determination is based on their long-term ability to isolate contaminants from the water column, minimal impacts to aquatic resources and human health, and their immediate availability and high probability of success.

3.2.3 Non-Local Disposal Strategies

The second group of disposal alternatives consists of disposal opportunities outside the metropolitan New York/New Jersey region. These include near shore sites located within the greater New York/New Jersey region as well as a variety of disposal options outside the region. In any of these settings, all necessary state permits would be required for the acceptance of dredged material as fill. If the sites involve impacts to wetlands over which the USACE has jurisdiction, then federal compliance requirements would be met under that regulatory program. If a disposal alternative becomes available for the KVK/Newark Bay project whose impacts have not been addressed by the NEPA permit process, then the New York District will supplement this NEPA document.

3.2.4 Long-Term Disposal Strategies

The third group of disposal options also contain solutions that are anticipated to become available over the projected life (50 years) of the KVK/Newark Bay Channel Deepening Project. Within this time frame, maintenance dredging will be required, and any additional disposal alternatives developed subsequent to this EA should be considered for the disposal of materials generated by the Operations and Maintenance (O&M) Program. The 1986 General Design Memorandum estimated that the annual shoaling rates of the channels at 40 foot depth are approximately 594,300 cubic yards per year. It is estimated that deepening the channels to -45 feet MLW will increase the annual maintenance dredging requirement by about 138,700 cubic yards per year or a total of 733,000 cubic yards per year (Appendix B - Hydraulic Studies, SEIS 1986).

The third group of alternatives are dependent on the implementation of the policies mandated in the Administration's closure of the Mud Dump Site (July 24, 1996) (see Appendix B). In that statement and in other authorizations, the USACE has been directed to evaluate all feasible disposal alternatives for dredged material needed to maintain and improve the Port of New York and New Jersey. This process is currently underway. The New York District has recently issued the Interim Report documenting the progress to date, as well as potential alternatives for incorporation into the scoping for a comprehensive EIS. Two of the many DMMP alternatives, which may become available for the O&M needs of the KVK/Newark Bay Navigation Project, are the construction of an aquatic containment facility and the implementation of emerging decontamination technologies. If a disposal alternative becomes available whose impacts have not been addressed by a state or federal regulatory process, then the New York District will supplement this document.

4.0 AFFECTED ENVIRONMENT

The purpose of this section is to provide an update of the information contained in the FEIS (USACE 1980) and SEIS (USACE 1987) and an analysis of whether there are significant differences between the current conditions and the conditions described in the FEIS/FSEIS from which the analysis of impacts was conducted.

4.1 Biological Resources.1 Biological Resources

In the FEIS, the District committed to a biological monitoring program within the project area. Baseline data for pre-dredging benthic and fisheries communities were compiled during 1984 and 1985 and were presented in Appendix C to the SEIS. Since then, there have been additional recent studies that have examined the biological resources of the New York/New Jersey Harbor area, in general, and the Newark Bay/Kill Van Kull area, specifically, in support of the District's DMMP and other programs (e.g., USACE WES, 1996; Will, 1996; National Marine Fisheries Service, 1995; Wilber and Will, 1994). These data have been used to update the baseline information as part of this EA. Additionally, the District will continue the monitoring program initiated prior to the construction of Phase I upon completion of the Phase II portion of the authorized plan.

4.1.1 Benthos

The FEIS (USACE 1980) reported on a limited (one-time) benthic sampling program which was conducted in Newark Bay in the spring 1976. The KVK was not sampled due to intensive scouring action. The Newark Bay results were qualitative and showed the presence of polychaetes (unknown species, the spionid *Streblospio benedicti*, and nereid *Nereis* spp.), isopod *Cyathura polita*, mud crab *Neopane texana*, mussel *Mytilus edulis*, and bivalve *Tellina agilis*.

For the SEIS (USACE 1986), Cerrato (1985) and Chezik (1985) conducted spring (May) and summer (August) sampling in 1985 within Newark Bay, respectively. Thirty stations were sampled throughout the western and southern half of Newark Bay and the KVK in the vicinity of Shooters Island. Sampling stations included shallow water flats (7 - 18 ft) and adjacent deeper water channels (33 - 40 ft). In general, greater numbers of species and higher abundances were recorded during the summer. Abundance and diversity of organisms were lower in the northern portion of Newark Bay than in the southern portion. No statistical association was found between depth and faunal composition. The SEIS reported that the sampling stations comprised mostly of silt and clay had lower species diversity and abundance.

The SEIS (USACE 1986) reported that the Newark Bay benthic community was dominated by polychaete worms, which are habitat generalists and exhibit high tolerance to environmentally stressful conditions such as low dissolved oxygen (DO) levels. Two polychaete worms - *Streblospio benedicti*, *Sabellaria vulgaris* - and the soft-shelled clam *Mya arenaria* - were dominant during both the spring and summer periods. Three different polychaete species - spionids *Scolecolepides viridis* and *Polydora ligni* and nereid *Nereis succinea* - were dominant in the spring, being replaced by *Spio setosa* (polychaete), *Balanus improvisus* (barnacle), and *Molgula manhattensis* (tunicate) during the summer. There was a high degree of variability in individual species abundance levels between the shallow and deepwater stations; however, there was no significant difference detected in the abundance or species representation between the two habitats. It appeared that the variation among stations was due to differences in sediment granulometry. Stations characterized by fine-grained sediments (silt and clay) exhibited lower species numbers and lower overall abundance. The moderate abundance and generally low species diversity in the benthos suggested that Newark Bay exhibits a stressed environment that restricts the development of a diverse and abundant benthic community.

Recent sampling of twenty-five stations (18 channel and 7 shallow water stations) in northern and central Newark Bay for benthos during 1993 (June, August and December) and 1994 (March) (NMFS 1995) found as in earlier studies by Cerrato (1985) and Chezik (1985), the benthos at both the shallow water and channel stations exhibited similar species composition (dominated by polychaete worms) and seasonal abundance patterns. The dominant species during June, August and December 1993 was *Streblospio benedicti*. The polychaete *Tharyx* sp. was dominant in March 1994. Other dominant species included the polychaetes - *Leitoscoloplos robustus* and *Mediomastus ambiseta*, the cumacean *Leucon americanus*, and Oligochaeta.

The National Marine Fisheries Service (NMFS) (1995) and USACE Waterways Experiment Station (WES) (Wilber 1996) conducted a joint benthic sampling program under the DMMP, that included stations in Newark Bay. Similar to results contained in the SEIS (USACE 1986), infaunal polychaetes dominated the benthic assemblage in both studies. The WES (1996) study utilized sediment profile imaging technology in conjunction with grab samples to characterize the benthic community. Dominant species in the both studies included the spionid polychaete *Streblospio benedicti*, cirratulid polychaete *Tharyx* sp., capitellid polychaete, *Mediomastus ambiseta*, and orbinid polychaete *Leitoscoloplos robustus*. *Streblospio benedicti* dominated the summer samples while *Tharyx* sp. dominated during the winter months and early spring.

A benthic sampling program was conducted in Newark Bay from April 1995 through March 1996 for the Newark Bay Confined Disposal Facility (NBCDF) DEIS (USACE 1997) . Only shallow water (water depth less than 4 ft) habitats were sampled. Seven stations were established: five stations were in Newark Bay and included stations in the immediate vicinity of the proposed NBCDF. Two stations were outside Newark Bay, one near the Bayonne Bridge and one near the Goethals Bridge. Samples were collected monthly.

The NBCDF DEIS (USACE 1997) reported that the Newark Bay/KVK benthos was dominated by polychaete worms. Six polychaetes were among the ten most abundant species identified in Newark Bay sediment samples. Dominant species was *Scoloplos* sp. which accounted for 28.5 percent of total. Five other polychaete worms ranked in the top ten were *Streblospio benedicti*, Personidae spp., Phyllodocidae spp., *Glycera* sp., and *Polydora ligni*. The other species accounting for the top ten abundance included: two bivalves, *Mulinia lateralis*, and *Mya arenaria*; the isopod *Cyathura polita*, and the cumacean *Oxyurostylis smithii*. Species composition and abundance were similar among the five Newark Bay stations. The greatest

abundance and species representation was noted during the late winter-early spring period, and the lowest during the summer months.

Although there has been some variability in the dominant species described in studies conducted in Newark Bay since the publication of the FSEIS (USACE 1987) due to differences in sampling methods and seasons when samples were collected, the recent studies concur with the previous results. There has been limited benthic sampling conducted within the KVK however, it assumed that the communities are similar to those in Newark Bay. The Newark Bay benthic communities are dominated by polychaetes and bivalves of which many of the species are characteristic of polluted or organically enriched environments. The benthic community of Newark Bay is similar to the soft sediment benthic community found throughout the New
York/New Jersey Harbor complex. In general, the benthic habitats within the project area are predominantly unconsolidated sediments comprised of silt and sand.

Similarities in species abundance and occurrence patterns between dredged and nondredged areas suggest that dredging operations have had a minimal long-term influence on the Newark Bay benthic community. The Newark Bay benthic community exhibits relatively low species diversity, moderate to low abundance levels, and dominance by polychaete worms which have life history characteristics, such as high reproduction and turnover rates and high dispersal ability that allow them to be resilient to changing environmental conditions.

4.1.2 Finfish and Shellfish

A limited sampling program for finfish was conducted for the FEIS (USACE 1980). Trawls were collected in June and August 1976. Six species were collected in the four June trawls; bluefish (*Pomatomus saltatrix*), striped anchovy (*Anchoa hepsutus*), blueblack herring (*Alosa aestivalis*), alewife (*Alosa pseudoharengus*), tomcod (*Microgadus tomcod*), and blue crabs. Four species were collected in August; porgy (*Stenotamus chrysops*), striped anchovy, blue crab, and bluefish.

The USACE and USFWS conducted monthly fisheries sampling for Newark Bay during July 1984 - June 1985 with the results included in the SEIS (USACE 1986). Thirty-eight species of fish were caught. The dominant species were Atlantic tomcod, bay anchovy, and winter flounder. Over 50 percent of the finfish caught during the study were demersal (i.e., bottom-dwelling) fish, including winter flounder and Atlantic tomcod which feed upon the benthic fauna. Low overall fish abundance in August and September 1984 was attributed to excessively low dissolved oxygen in the shallows in August and September. In addition, there was generally lower overall abundance from December to March.

Winter flounder were taken in all the deep water trawls and a portion of the shallow water samples. Their numbers were generally low or absent in winter, increasing in early spring and then declining to late spring/summer levels before a second increase in the fall to their highest overall occurrence. Atlantic tomcod were also captured from each of the deep water trawls, with the greatest numbers occurring in late spring/summer, when juveniles dominated. Adult captures increased through the fall and winter. Tomcod are typically winter spawners with demersal eggs and the survey concluded that spawning was occurring in Newark Bay.

Other commonly encountered species in the 1984 -1985 study included the bay anchovy, weakfish and striped bass. None of these species were present year round, in either the shallow or deepwater portions of the project area. The striped bass had a fairly consistent presence from spring through late fall. Weakfish were quite numerous from late summer through fall, especially in the channels where cooler and more saline water occurs. The bay anchovy was also abundant

from summer through early fall, again with no discernable difference between the shallow and deep water areas of the project area. Of the other fish collected, the majority were migrants belonging to the herring group (e.g., shad, *Dorosoma cepedianum*; alewife, *Alosa pseudoharengus*; menhaden, *Brevoortia tyrannus*; Atlantic herring, *Clupea harengus*; and, blueback herring, *Alosa aestivalis*).

The SEIS (USACE 1986) concluded that the project area contains a fish community similar to that found throughout the harbor. The most likely resident species were winter flounder and tomcod. Winter flounder were collected in all the deepwater trawls and most of the shallow-water trawls. Their numbers were generally low (or absent) in winter, increasing in early spring and then declined to late spring/summer levels before a second increase in the fall, to their highest overall occurrence. Within the shallows, adults appeared to occur mainly in the fall. The SEIS reported that winter flounder spawn in shoal areas during the winter and that their movement out of the channels and shallows during this season suggests spawning is not occurring within the Newark Bay/KVK area. However, the presence of large numbers of juveniles in the spring suggests the area is a nursery for developing flounder. The SEIS stated that Newark Bay/KVK is not an exclusive or even primary habitat considering the extensive presence of juveniles throughout the harbor.

The SEIS reported that Atlantic tomcod were captured from each of the deepwater trawls, with the highest abundance occurring in the late spring/summer, when juveniles dominated. Adult captures increased through the fall and winter. As reported in the SEIS, tomcod are typically winter spawners and the USFWS 1984 -1985 data suggested that spawning was occurring in Newark Bay though likely at a lesser level than compared to the lower Hudson River.

The SEIS concluded that Newark Bay was an equivalent habitat to its surrounding portions of the Hudson estuary and did not contain any specialized habitat nor was it utilized in any special manner by any species inhabiting it. There was limited fish sampling within the KVK; however, many of the species identified in Newark Bay are also present in the KVK.

A survey of fish distribution was conducted in Newark Bay from May 1987 - April 1988 to generate a baseline of data for fish distributions prior to Phase I deepening of the federal navigation channel through the area (Will and Houston 1992). Results were similar to those reported in the 1984 - 1985 study. The monthly samples indicated that fish were most abundant in the deeper waters of the navigation channel. The study concluded that the area supports large populations of many species of fish, including Atlantic tomcod and winter flounder.
From May 1993 to April 1994, the NMFS (1995) performed a biological and hydrographic survey of Newark Bay. A total of 56 species representing 37 families of fish and megainvertebrates were identified. Forty-three species of fish were collected in the ten Newark Bay channel stations compared to 23 species collected on the shoals. Overall, the ten dominant species, in decreasing order of abundance, were striped bass; Atlantic tomcod; male blue crabs, *Callinectes sapidus*; white perch, *Morone americana*; female blue crab; weakfish; winter flounder; spotted hake, *Urophycis regius*; rainbow smelt, *Osmerus mordax*; and grubby, *Myoxocephalus aenaeus.* These species dominated catches throughout the study accounting for greater than 94 percent and 92 percent of the total number and weight, respectively, of all species collected. The five dominant fish were most abundant during the following months: striped bass - November, February, and March; Atlantic tomcod - June, July, and August; white perch - November, February, and March; weakfish - August, September, and October; and winter flounder - August, November, and December.

There was a distinct difference in the seasonal occurrence of fish between the channel and shoal stations. Fish were abundant in every month at the channel stations, while they were nearly absent from the shoals from November - April. Striped bass and white perch were particularly abundant at the channel stations during the winter months.

Shellfish collected during the NMFS (1995) study included, in order of abundance: blue crab, rock crab (*Cancer irroratus*), lady crab (*Ovalipes ocellatus*), spider crab (*Libinia emarginata*), horseshoe crab (*Limulus polyphemus*), American oyster (*Crassostrea virginica*), and soft-shelled clam. Bottom trawls in the channel produced more large invertebrates than shoal sampling. Blue crabs were collected in abundance only at the channel stations, accounting for 98.6 percent of the total number of invertebrates collected. The studies conducted for the SEIS (USACE 1986) did not note the importance of the channel habitat for blue crabs. These recent data indicate the deep channels are an important habitat for overwintering male blue crabs which burrow in the sediment during the late fall and winter.

For the NBCDF DEIS (USACE 1997), the District conducted trawl sampling in shoal areas in Newark Bay and at a channel station near the Bayonne Bridge in the KVK and Goethals Bridge in the Arthur Kill from April 1995 to March 1996. Twenty-seven species of fish were collected in 1995 in the combined shoal and deepwater stations. Four species - grubby, scup, spot, and cunner were only collected in the channel station. Similar to the NMFS (1995) study, it was reported that shoal areas in Newark Bay are used by fish from late spring through fall, but fish are nearly absent from the shoals during winter. The 1995 - 1996 study did not find a difference in species representation or abundance among the four Newark Bay shoal stations sampled over a one-year period. The deeper navigation channels, on the other hand, were used throughout the year. During winter, fish abundance was high in channel areas and the fish community was dominated by few species, particularly striped bass and white perch. Four species, striped bass, winter flounder, summer flounder, and bay anchovy occurred in samples collected each month. Blue crabs were abundant at all shoal stations in Newark Bay. Their seasonal occurrence on the shoals was limited to April through October.

Length frequency distribution of the NBCDF samples (USACE 1997) indicated a broad range of striped bass occur in Newark Bay, encompassing age classes ranging from yearlings through the second year age class. There was an occurrence of a few individuals in the 10-40 mm range suggesting striped bass may have spawned in the Newark Bay vicinity.

In summary, the results of the recent studies agree with the results contained in the SEIS (USACE 1986) even though sampling equipment, methods, and sample designs varied among the studies. Newark Bay and KVK contain a diverse fish community dominated by the abundance of a relatively small number of species. The dominant species - striped bass, winter flounder, bay anchovy, and Atlantic tomcod - were abundant or common in each study. The presence of large numbers of the smaller individuals of the dominant species shows that Newark Bay is an important nursery area for some species. A number of species occur commonly, but on an annual basis are generally present in smaller numbers or were present only for short periods of time.

Blue crabs were abundant in the trawl samples in the NMFS (1995) study. They occurred on the shoals from April through October but not during the remainder of the year. They were present in the channel during the winter months, but their relative abundance during this time period may not have been well represented because they burrow into the sediment.

4.1.3 Avifauna

The FEIS (USACE 1980) reported that due to metropolitan pressures throughout the region, the bird populations in the project area were markedly reduced from historic levels. Nevertheless, many of the common species associated with waterfront areas and inland estuaries, as well as those of the open field habitat and residential neighborhoods, were present within the vicinity of the project area and the FEIS provided a complete list of species present. The SEIS (USACE 1986) did not update the information provided in the FEIS.

Since publication of the FEIS/SEIS, recent studies have examined Shooters Island which is located near the project site and various studies have noted its importance for breeding population of wading birds, seabirds and waterfowl. Shooters Island is located in an important habitat area known as the Harbor Herons Complex. This complex extends from Shooters Island southward along the Arthur Kill to a point just south of the Isle of Meadows, and extends eastward onto Staten Island to the edge of existing development east of the West Shore Highway. Shooters Island was identified as an important mixed herony in the mid-1970's. Species diversity and abundance has greatly increased since then (USACE 1996).

Kerlinger (1996) reported that, during early summer of 1996, the following species of nesting birds were observed: great egret (*Casmerodius albus*); snowy egret (*Egretta thula*); the tricolored heron (*E. tricolor*); the cattle egret (*Bubulcus ibis*); the black-crowned night heron (*Nycticorax nycticorax*); the green heron (*Butorides striatus*); the glossy ibis (*Plegadis falcinellus*); the double crested cormorant (*Phalacrocorax auritus*); herring gull (*Larus argentatus*); the great black backed gull (*L. marinus*); Canada goose (*Branta canadensis*); and the mallard (*Anas platyrhynchos*). The U.S. Fish & Wildlife Service (USFWS) documented a nesting colony of least terns on the western shore of Newark Bay in 1990. This colony no longer exists; however, there is potential for the least tern and other terns to nest in the area should suitable nesting conditions return.

The 1996 midwinter waterfowl surveys have reported that Newark Bay is used by the greater scaup (*Aythya marila*) and lesser scaup (*A. affinis*); the canvasback (*Aythya valisineria*); the mallard; the black duck (*A. rubripes*); the gadwall (*A. strepera*), bufflehead (*Bucephala albeola*); the hooded merganser (*Lophodytes cucullatus*); the common merganser (*Mergus merganser*); and the red breasted merganser (*M. serrator*).

In addition to the above reports and studies, the NBCDF FEIS (April 1997) reported on the avifauna of Newark Bay and vicinity. It reported that large overwintering rafts of diving ducks forage and rest within the NY/NJ estuary. About 15 species of diving ducks can be expected to pass through and use portions of the NY/NJ estuary for migration stopovers and for overwintering. Concentrations are comprised primarily of canvasbacks, greater scaup, and buffleheads, with lesser number of mergansers. In addition, mallards and black ducks are common nesters in the area, with occasional nesting by gadwall, green-winged teal, and blue-winged teal. Overwintering species include gadwalls, black ducks, pintails, and mallards. A variety of shore birds including plovers, woodcock, snipe, turnstones, sandpipers, yellowlegs, dunlin, and sanderling migrate through the area. Most shorebirds prefer to feed in wet sand and mud in dewatered areas to areas having only a few inches of water.

4.1.4 Other Wildlife

The FEIS (USACE 1980) reported that due to intensive development within the adjacent waterfront there was limited wildlife present including Norway rat (*Ratticus norwegicus*), gray

squirrel (*Sciurus carolinensus*), muskrat (*Ondatra zibethica*), and cottontail rabbit (*Sylvilagus floridanus*). The SEIS (USACE 1986) did not update the information provided in the FEIS.

The USFWS (1997) has reported that the diamondback terrapin (*Malaclemys terrapin*) is known to inhabit the Hackensack Meadowlands, located north of the project area. USFWS (1997) concluded, however, that the Kill Van Kull and Newark Bay do not provide optimal habitat for the diamondback terrapin but they may occur in limited numbers in the project area. In addition, seals may occasionally occur in the nearshore waters in the project area. The harbor seal (*Phoca vitulina*) is the most commonly observed seal along the nearshore waters of this area of the Atlantic Ocean (USFWS 1997).

4.1.5 Threatened and Endangered Species

The FEIS (Appendix I) (USACE 1980) reported that the project area is within the historic range of the American peregrine falcon (*Falco peregrinus*) and southern bald eagle (*Haliaeetus leucocephalus*) which were listed as endangered by the USFWS. Peregrine falcons were not nesting within or adjacent to the project area at the time. In addition, the FEIS reported that the yellow crowned night heron occurred within the project area and was listed as threatened by the State of New Jersey. The SEIS (USACE 1986) did not update the information provided in the FEIS.

More recently, documentation from the USFWS has noted the increasing occurrence of these species. The USFWS (1997) reported that the peregrine falcon and an occasional transient bald eagle are known to occur in the project area (see Coordination Act Report, Appendix C). The project area is within the historic range of the peregrine falcon which is federally listed as endangered and the southern bald eagle which is federally listed as threatened. Documented peregrine falcon nest sites are located on the Bayonne Bridge which spans the Kill Van Kull, north of the study area adjacent to the Hackensack River in Kearny, New Jersey, and south of the project area on the Goethals Bridge over the Arthur Kill.

The NMFS reported in 1996 that several species of sea turtles, including the threatened loggerhead (*Caretta caretta*), and the endangered Kemp's Ridley (*Lepidochelys kempii*), green (*Chelonia mydas*), and leatherback (*Dermochelys coriacea*), may be found in the upper New York Harbor area from spring to mid-fall (see Appendix D - Relevant Correspondence).

Since the shortnose sturgeon (*Acipenser brevirostrum*) frequents the adjacent Hudson River, the USFWS (1997) (Appendix C) noted the possibility does exist of this federally listed endangered species migrating into the Kill. However, as noted in the NBCDF DEIS (1997), shortnose sturgeon has not been collected in any of the studies conducted in Newark Bay and adjacent waters.

The yellow crowned night heron occurs within the project area and is listed as threatened by the State of New Jersey (USACE 1980, USFWS 1997).

4.2 Cultural Resources

The original cultural resources survey for the project was prepared by the District in 1976. Five properties eligible for the National Register of Historic Properties were found; the Sailor's Snug Harbor Historic District, the Neville House, and the Greek Revival Mansion at 404 Richmond

Terrace on Staten Island, and the Port Johnson Historic Sailing Vessels and Pier No. 2 (the Atlas Yacht Club Pier) in Bayonne, New Jersey.

Recent cultural resources investigations conducted in connection with the New York Harbor Collection and Removal of Drift Project have identified a number of vessels eligible or potentially eligible for the National Register of Historic Places (NRHP) along the Kill Van Kull shoreline. Ten vessels are found within five clusters along the Staten Island side of the waterway, and three vessels are located along the Bayonne shoreline. A structure, the B&O Transfer Bridge, was identified along the Staten Island shore. Another vessel at Port Johnson was also determined potentially significant as a contributing element to the Port Johnson Historic Sailing Vessels cluster.

4.3 Recreation

The FEIS (USACE 1980) reported that the area does not present recreational opportunities for those citizens bordering the Bay and the Kill Van Kull. They have been generally limited as a result of economic activities, pollution and lack of available sites. In addition, it reported that study area waters are used by recreational boaters mainly as a means of transiting to other, more desirable boating locations within the region. Major recreational outlets are not available in the area. The FSEIS (USACE 1987) did not result in any changes to the conclusions presented in the FEIS.

The area also serves the recreational needs of the residents of the cities bordering the project. Although the area does present recreational opportunities for those citizens, it has been generally limited as a result
of economic activities, pollution, and lack of available sites. Several parks line the Bay and Kill. These parks are chiefly used by local residents for sports and relaxation.

Several marinas are located within the project area. A greater number are located along the Hackensack and Passaic Rivers. While the waters of Newark Bay and Kill Van Kull offer limited attractions to boaters, they are used in transiting to various points within the metropolitan marine area.

Pollution has also limited sport fishing in the project area. As noted in the FEIS (USACE 1980), crabbing was the dominant activity with some anglers interested in eel, stripers, spot, Atlantic tomcod and blues. This activity continues today, however, New Jersey Department of Environmental Protection (NJDEP) continues to have health advisories posted against consumption of fish and shellfish caught in the project's waters.

4.4 Sediments

The FEIS reported chemical analysis of the sediment which showed the presence of mercury, cadmium, and chromium. Analysis for PCBs and DDT produced results below laboratory detection limits.

For the SEIS (USACE 1986), existing bioassay/bioaccumulation data from the ongoing Operations & Maintenance (O&M) program was used to characterize sediment quality for the project area. Sediment samples collected from 1983 - 1986 were used. The results revealed that the sediment was suitable for unrestricted ocean disposal. To determine if the dredged material resulting from the deepening to 45 feet could be characterized by the O&M testing results, the general stratigraphy underlying the project was examined from core samples collected throughout

the area. The analysis concluded that the results of the O&M testing adequately described the sediment quality of the project area. Because the bioassay/bioaccumulation testing on the O&M material passed the test for unrestricted ocean disposal, it was concluded that the sediments to be dredged for the project would similarly pass. The SEIS also reported on a dioxin sampling program conducted within the project area which showed that only one sample of the 58 samples analyzed had a detectable dioxin level. The sample was the upper 0 - 12 in. in a shoal area off Port Elizabeth with a level of 0.2 parts per billion (ppb).

Changes in USEPA/USACE dredged material testing protocols since the publication of the FEIS and FSEIS will likely result in a determination that a portion of the KVK/Newark Bay channel material is unsuitable for ocean disposal. Recently, the District has conducted a sediment characterization study of boring data collected within the project area to estimate volumes of the material to be dredged from the project area since Phase I construction to 40 ft (refer to the Dredged Material Characterization Report for the KVK/Newark Bay Channels, USACE 1997). The study has characterized the material as black mud which is considered unsuitable for ocean disposal, unconsolidated sediments that are suitable for ocean disposal, and bedrock. On the basis of revised analysis for the Final EA, the District estimates that construction will result in approximately 1.1 million cubic yards (mcy) of rock and approximately 9.6 mcy of sediments. It is estimated that approximately 6.3 mcy of the sediments may be suitable for ocean disposal (USACE 1997). Boring data indicate that based on sediment type and stratigraphy approximately 3.3 mcy of sediments may contain levels of contaminants that may limit or prohibit their disposal in the ocean (USACE 1997). Appropriate procedures approved by the USEPA and the District will be undertaken to ensure proper determination.

The NBCDF FEIS (1997) included recent sediment chemistry information for portions of Newark Bay. In addition, the sediments of Newark Bay have been analyzed for physical properties and chemical concentrations as well as toxicity as part of NOAA's National Standard Trends and Status Program (Long et al. 1995).

4.5 Water Quality

The water quality information presented in the FEIS showed that the dissolved oxygen (DO) levels in the project area ranged from a high of 8.4 mg/l in April to a low of 1.4 mg/l in August 1976. Surface and bottom water were collected at three stations in the KVK, three stations in Newark Bay with the remaining six stations either in the Arthur Kill or the Passaic and Hackensack Rivers. The FEIS (USACE 1980) concluded that during the summer months, DO was below the critical value necessary to sustain a viable aquatic community. Subsequent to the FEIS, work by McCormick *et al.* (1983) showed that during periods of maximum wastewater discharge in 1980 Newark Bay was anoxic or nearly so.

For the SEIS (USACE 1986), the USFWS (1985) performed water quality analysis during a survey of fishery resources through out the New York Harbor region from July 1984 to June 1985 and noted that the DO levels ranged from 3.4 to 11.1 mg/l in the KVK/Newark Bay reach. However, during October to December no DO measurements were collected because of inoperative equipment. No depth of sampling was provided. The USFWS divided the study area into reaches with the first reach being the KVK and Newark Bay. The data provided in the report were averages for the reach.

As part of the baseline study for the SEIS, Cerrato (1985) and Chezik (1985) collected DO levels during the May and August benthic sampling program which were primarily in Newark Bay and

at three stations near Shooter's Island. Results from the May 1985 sampling event showed that DO ranged from 5.1 to 7.4 mg/l, while the August 1985 results ranged from 5.3 and 7.8 mg/l.

The New York City Department of Environmental Protection (NYCDEP) monitors water quality in the Kill Van Kull at two stations. One station is at its western end at Shooters Island, and the other is at the eastern end at Constable Hook/New Brighton. Upgraded harbor wide sewerage systems have improved total coliform trends from summer geometric means in 1972 of greater than 10,000 MPN/100 ml to 71-2400 MPN/100 ml in 1994. Similarly, historical data show that dissolved oxygen in Kill Van Kull waters has been increasing, and the 1994 average summer DO content was 5.0-6.0 mg/l in both surface and bottom waters and met the dissolved oxygen criterion of 3.0 mg/l as compared to 2.5 mg/l and 1.4 mg/l in surface and bottom waters, respectively, reported in the FEIS. Nutrient levels are generally greater in the western half of the Kill Van Kull than in the eastern half. Recent evaluation of DO trends (USACE 1997) indicates that, since 1968 (recorded at Shooters Island), DO levels have exhibited a steady increase attributable to upgraded wastewater treatment. In the last ten years, the DO at Shooters Island has exceeded the NYCDEP criterion of 3.0 mg/l.

The New Jersey and New York classification system for water bodies have changed since publication of the FEIS. The Kill Van Kull is an interstate waterbody and is classified by the New York State Department of Conservation (NYSDEC) as SD (NYCDEP 1995). The best usage of Class SD saline surface waters is fishing (Water Quality Regulations, 6 NYCRR Parts 700-705). SD waters should be suitable for fish survival. It is classified by New Jersey as SE3 (Surface Water Quality Standards N.J.A.C. 7:9B. April 1994). The designated uses of SE3 saline waters of estuaries are: secondary contact recreation; maintenance and migration of fish populations; migration of diadromous fish; maintenance of wildlife; and any other reasonable uses. It is classified by the Interstate Sanitation Commission as Class B-2 (ISC Organization and Regulations as amended June 1986). B-2 waters are suitable for the passage of anadromous fish and for the maintenance of fish life.

New Jersey has designated Newark Bay as a waterbody where use impairment is suspected due to toxic discharges from point sources (NJDEP 1995). Fish advisories have been issued due to high levels of PCBs and pesticides in finfish from the bay.

Newark Bay is classified by New Jersey as SE3 (Surface Water Quality Standards N.J.A.C. 7:9B. April 1994). It is classified by the Interstate Sanitation Commission as Class B-2 (ISC Organization and Regulations as amended June 1986).

Newark Bay is a partially stratified estuary with lower salinity at the surface and higher salinity at the bottom. Surface salinity is lowest at the mouth of the Passaic River and highest at the confluence of the Kill Van Kull. The highest total suspended sediment (TSS) concentration in the surface water occurs in the spring in the Passaic River. The TSS concentration in near-bottom water in Newark Bay are higher in the northern portion of the Bay than in the southern portion (Suszkowski 1978).

According to water quality standards established by NJDEP, fecal coliforms in Class SE3 waters should not exceed a geometric mean of 1500 counts/100ml. The geometric mean at NYCDEP's Shooters Island station in surface and bottom waters during 1994 were 67 and 68 counts/100ml respectively (USACE 1997).

Concentrations of arsenic, cadmium, nickel, lead, silver, and zinc in all water samples from the January and October 1991 and May 1991 surveys (USACE 1997) were lower than the USEPA criteria. Only total recoverable mercury levels were consistently higher than the criterion.

Based on the information presented, the water quality conditions in the KVK/Newark Bay channel deepening project area have shown improvement since publication of the FEIS (USACE 1980) and SEIS (USACE 1986) in both surficial and bottom water conditions.

4.6 Navigation

The FEIS (USACE 1980) reported that vessel accidents recorded by the Coast Guard District were reviewed for the period between 1968-1975. Accidents in the area were divided into four categories: collisions, ramming, groundings, and other. The four major causes of accidents were: judgement error (50 times), equipment failure (19 times), violations of regulation (17 times), and inadequate tug control (10 times). In the project area it was projected that by the year 2035, approximately 26 navigation accidents would occur per year an increase from 12 accidents per year in 1975 and 20 accidental oil spills would occur up from the 1975 total of 9 accidents per year. This information was not updated in the SEIS (USACE 1986).

The volume of vessel traffic and the consequent increase in the potential for accidents is a major concern. Modern tankers with deep sailing drafts are required to lighter a portion of their cargo in order to safely transit the Port's current navigational channels. This is accomplished either by lightering into one or more barges or by lightering into another tanker. Both methods result in increased vessel traffic. Other vessels, such as containerships or dry bulk carriers, may be light loaded for their voyage or may anchor in deep water to await a favorable tide that it can ride through a channel with otherwise inadequate clearance. The former practice requires a larger number of vessels to transit the channel in order to move a given volume of cargo. The latter practice leads to congestion and consequent delay during the time periods during which the tide is favorable. These practices (lightering, light loading, and tide riding) contribute to congestion in anchorages and an increased potential for grounding, collisions, allisions, or spills, with the attendant potential for adverse environmental impacts to the estuary.

In 1994, U.S. Coast Guard records indicate that there were a total of 90 instances of accidents involving grounding, collision, allision, or pollution in the New York Bay region. The numbers of each type of incident are given below:

State/Incident	Grounding	Collision	Allision	Pollution	Total
New York	9	2	11	22	44
New Jersey	4	0	6	36	46
Total	13	2	17	58	90

4.7 Socio-Economic

The FEIS (USACE 1980) reported that manufacturing was the most important single industry in terms of employment and payroll. In addition 58 percent of the imports into the Port were dispersed within a 25-mile radius of the metropolitan area. During the decade from 1968 to 1977, Newark Bay's share of total general cargo outbound increased from 1,580,000 to 2,960,000 short tons with inbound cargo increasing from 1,990,000 to 4,390,000 short tons. During the years 1973-74 approximately 34,200,000 short tons per year of petroleum products were delivered in the Kill. This was expected to increase by 1 percent per year. The receipt and shipment of general cargo was 6.7 million net cargo and 5.1 million containerized cargo. This amount was expected to more than double over the next 50 years. No additional socio-economic analyses were provided in the SEIS (USACE 1986).

The District recently completed a preliminary economic analysis of the Port as part of the DMMP process (USACE 1996). An estimated 120 million tons of cargo with value in excess of $93 billion passed through the Port of New York and New Jersey in 1995. The total regional monetary impact of the Port is estimated at more than $29 billion, and the number of jobs directly and indirectly associated with the Port totals approximately 193,000. The State of New York exported $34 billion of goods to over 200 countries throughout the world in 1994, ranking it third among the 50 states. Of goods manufactured in New York, 16 percent, or $2.4 billion, was exported, which serves to illustrate the importance of export trade in maintaining New York's manufacturing economy. The existence of the port is essential for other regional industries that are significantly dependent upon direct access to the port and water-borne shipping. These industries include: electric power generation, ready-mix concrete manufacturing, sugar refining, and scrap and waste material processing. Of the 166,000 jobs in the region directly related to the Port, 90,000 are either located in New York or held by New York State residents, and economic activity generated by cargoes moving through the region's port facilities results in over $12 billion in sales for New York State firms.

International water-borne trade is also important to New Jersey's economy. The 12th largest exporting state, New Jersey shipped over $13 billion of goods throughout the world. Of 500,000 manufacturing jobs in the state, 70,000, or 14 percent, are dependent on exports. Chemicals and pharmaceuticals manufacturing, the third largest industry in New Jersey, relies on the port as an efficient conduit for both the export of its products and the import of raw materials and other inputs. The recycling industries are heavily dependent on the port for the export of their products. In 1994, 1.5 million tons of iron and steel scrap were exported from the Port, and New Jersey firms shipped 95 percent of this total. Of the 166,000 port related jobs in the region, 76,000 are either located in New Jersey or are held by New Jersey residents, and economic activity generated by the Port and its dependent industries creates $13.5 billion in sales for New Jersey firms.

5.0 ENVIRONMENTAL IMPACTS AND MITIGATION

The purpose of this section is to provide an update of the analysis of impacts presented in the FEIS and FSEIS and to determine the significance of any differences.

5.1 Biological Resources

5.1.1 Benthos

The studies conducted since 1986 describe a benthic community which is similar to that described in the SEIS (USACE 1986); one dominated by infaunal polychaetes and the soft-shelled clam. Consequently, the anticipated impacts to the benthic community within the project area are similar to those discussed in the SEIS (USACE 1986). These effects which essentially occur as a result of the proposed dredging activities would result in the elimination of the organisms that occupy the construction area and benthos in the immediate vicinity of the site that would be influenced by stress gradients, including sedimentation of suspended dredged material, scouring, and blasting. The life cycle activity of the benthic infauna present within the project area is generally limited to the top few centimeters of the bottom sediments. These infaunal organisms have limited mobility and will be more susceptible to disturbance than epibenthic organisms such as crabs and shrimp. Dredging will also result in temporary loss of benthic habitat; therefore, bottom-feeding predators would suffer a temporary loss of prey until the area is repopulated after the completion of the dredging activities with the project site. These impacts do not represent any significant change from those discussed in the FEIS.

Continuing benthic studies in the project area have confirmed that the community has low overall species diversity, with polychaete worms dominating. No difference was found in the overall composition of the benthic community between the shallow water habitat and deeper water habitat in maintained navigation channels although there were differences among individuals stations due to differences in sediment composition. The overall similarity in the composition of the benthos throughout the project area provides a large and nearby source of individuals to recolonize the disturbed area. In addition, the majority of benthic species present within the project area have life history characteristics, such as high reproduction and turnover rates, high dispersal ability, and planktonic larvae, that make them resilient to disturbances so that recovery from dredging disturbance would be expected to be relatively rapid as described in the FEIS and FSEIS. Timing of disturbance is an important factor in benthic community recovery, because many benthic species have distinct peaks of reproduction and recruitment (LaSalle, *et al.* 1991). Studies conducted before and after maintenance dredging activities within the project vicinity confirm that benthic repopulation is rapid, with no observable alteration in species composition or seasonal abundance patterns (NBCDF DEIS, USACE 1997).

Dredging will be done in several small sections (reaches) over an eight-to-ten year period instead of one large area. This approach will promote recovery time and minimize potential impacts to the system. Therefore, undisturbed channel habitat will be available for the flounder as well as abundant shallow water habitat throughout the bay system which will remain undisturbed through the life of the project.

The large area of undisturbed habitat adjacent to the project site would be a source of organisms to recolonize the project area. The infauna, while lacking mobility, typically have early life stages that are carried by tidal currents to new areas. In addition, adult organisms are dispersed naturally when scour takes place as a result of high current velocities and wave action associated with storms.

In addition to the physical disturbance of dredging, there is a potential for the localized dispersion of some sediment during dredging. Best management practices will be used at the dredging sites to minimize the loss of sediment to the surrounding water. The loss rate would be very low, and the vast majority of sediments that do escape would resettle in the vicinity of the dredging and

disposal sites. Potential impacts resulting from sedimentation during dredging operations is expected to be localized and temporary.

There is a potential for resuspension of contaminated sediments during dredging. The contaminants in the dredged material were deposited from chemicals released from upstream sources. Because there is no source of chemicals at the dredging sites, dredging activity does not contribute any new quantities of contaminants to the aquatic environment. The disturbance and loss of a small amount of contaminants during dredging would result in a redistribution of these contaminants in the bay. Because there is widespread contamination in the bay sediments, the redistribution of a small quantity of contaminants in the bay would not appreciably alter the exposure levels of aquatic life to these contaminants. Best management practices will be employed to minimize resuspension in areas found to be contaminated. The District will coordinate with the USEPA and the Interagency Sediment Testing Team to finalize a sampling design which will evaluate the suitability of the material for ocean disposal.

Best management practices such as utilization of dipper and clam shell dredges will be employed in order to minimize disturbances and resuspension of solids in the water column. The District will continue to coordinate with the NJDEP regarding operational conditions during dredging. The District recognizes that the NJDEP may require a no barge overflow restriction during dredging of contaminated materials. The District will also consult procedures contained within the NJDEP's Draft March 1996 dredged material guidance manual. However, it should be noted that a no barge overflow restriction will greatly reduce the volume carried by each barge, significantly increase costs, and effectively transfer the concerns with the resuspension of materials from the dredge site to the disposal area.

5.1.2 Finfish and Shellfish

The studies conducted since 1986 describe a fish community within the project area which is similar to that described in the SEIS (USACE 1986); one dominated by striped bass, winter flounder, bay anchovy, and Atlantic tomcod, with the dominant shellfish species being blue crab. Therefore, the anticipated impacts to the finfish and shellfish communities within the project area remain similar to those described in the SEIS (USACE 1986).

The species of fish and shellfish that are abundant and ecologically important in Newark Bay and KVK are widespread and abundant in New York Harbor and nearby coastal waters and estuaries. The areas to be dredged do not represent critical habitat for any of these species and generally show population levels similar or somewhat below the main-stem Hudson and the NY harbor complex in general. The project's primary impact will be to deepen already deep water areas with the potential for some change in substrate composition due to the exposure of more bedrock, while some shallow water habitat may be impacted primarily to facilitate sideslope construction. Based on bathymetry data from June 1996 for the KVK, and April - May 1996 for Newark Bay, it is estimated that of the approximate 1500 acre project site, approximately 16 acres of unvegetated soft bottom shallow water habitat will be impacted. The deepening of the channel from 40 to 45 feet should not cause significant changes to the finfish or shellfish communities. Potential impacts to the localized distribution of demersal fish may result from a change from unconsolidated soft substrate to hard-bottom habitat in some areas. In addition, concerns on the effects on winter flounder have been expressed by the USFWS.

In its Coordination Act Report (Appendix C), the USFWS (1997) requested that the District initiate a survey to determine the abundance of overwintering blue crabs and winter flounder

throughout the project area. As part of the coordination for the authorized plan and prior to construction of Phase I of the KVK Navigation Project, the District (Cerrato, 1985) initiated a survey to monitor fishery impacts and collected baseline data. The NMFS (1995) study "A Biological and Hydrographical Characterization of Newark Bay, New Jersey, May 1993 - April 1994" is available for use to update the baseline study. The District will coordinate with the USFWS and NMFS to assess the need for including additional biological monitoring in order to determine appropriate measures to avoid adverse impacts to blue crabs and winter flounder as a result of construction activities.

As noted in the FEIS (USACE 1980), potential impacts to finfish and shellfish within the project area are anticipated to be temporary and localized. There is potential for some direct mortality of fish and shellfish within the proposed project limits during dredging operations; even though juvenile and adult fish and crabs are motile and can avoid dredging activities, However, blue crab mobility will be reduced in the winter when it burrows into the sediments and could thus be subject to increased impacts attributable to the dredging operations.

In addition, as noted in the previous project documentation, other short-term impacts would include the loss of benthic habitat and prey and localized increases in suspended sediment. As noted in the benthic discussion previously, there would be a temporary loss of benthic habitat that would result in a temporary loss of feeding area and prey organisms for some fish species. Estuarine and anadromous fish species appear to be fairly tolerant of elevated suspended sediments that naturally occur within the project area. Increased suspended sediment within the water column is not expected to adversely impact fish populations. Some fish species (e.g., white perch) deposit demersal eggs that generally remain in place on the bottom until larval hatching, and they may be susceptible to smothering due to increased sedimentation from dredging. Blasting may have localized potential impacts on fish in the immediate vicinity, but should not result in any long term impacts on the fish and shellfish communities in Newark Bay and the KVK. Conversely, removal and safe containment/treatment of contaminated sediments during construction should improve water quality within the project area.

The movements and migrations of the majority of fish species using the Bay are related to migrations of adults to spawning grounds, responses to temperature and salinity changes, onshore/offshore movements for access to seasonal habitat areas, and general dispersal patterns by species that are pelagic or follow watermasses. The actual exposure of individuals to the construction activities will depend on how the sequence of activities at the site correspond to the movement/migration patterns of the various species. Such exposure is not considered to be significantly different based on new information than which was anticipated by the FEIS and FSEIS in 1980 and 1986, respectively.

These impacts do not represent significant departures from those analyzed in the FEIS and FSEIS. The District will coordinate with the USFWS and NMFS to assess the need for including additional biological monitoring in order to determine appropriate measures to avoid adverse impacts to blue crabs and winter flounder as a result of construction activities.

5.1.3 Avifauna

As noted in the SEIS (USACE 1986), there is a potential for adverse impacts on nesting water birds on Shooters Island during nesting season due to the close proximity of blasting and/or dredging equipment. New information developed since 1986 does not indicate any changes in these conclusions. However, during construction of Phase I the District utilized the USFWS' recommendation that no blasting and/or dredging be conducted within 300 feet of Shooters Island

during the breeding/nesting season to avoid potential impacts to species which are present. With these precautions and based on nest counts and other data summarized by investigations referenced in the Shooters Island Reach EA (USACE May 1996), the District's previous construction activities appear to have had no adverse impacts on nesting water birds. The District will continue interagency coordination regarding appropriate measures, such as seasonal constraints to blasting, to avoid adverse impacts to nesting water birds at Shooters Island. Monitoring to ensure blasting and/or the operation of dredging equipment in proximity to Shooters Island during waterbird nesting season could be a component of a biological monitoring program to be developed in coordination with the USFWS.

5.1.4 Other Wildlife

The FEIS (USACE 1980) reported that impacts on wildlife in the project area will be minimal or non-existent. The SEIS (USACE 1986) did not change this conclusion. Under current conditions, the same conclusion is reached. Construction work will result in temporary disturbance to the area including increased noise due to the presence of workers and equipment. However, wildlife utilizing the area are expected to return after the completion of the project.

5.1.5 Threatened and Endangered Species

The FEIS (USACE 1980) reported that there were no anticipated impacts to endangered and threatened species as a result of the project. The SEIS (USACE 1986) did not revise this conclusion. Currently, the USFWS is concerned that channel deepening may cause resuspension of contaminated sediments and that the contaminants could be transported through the food chain and result in adverse impacts to peregrine falcons.

Peregrine falcons have established nests within and adjacent to the project site since publication of the FEIS and FSEIS. Pursuant to the Endangered Species Act, the District has prepared and submitted a Biological Assessment to the USFWS on March 12, 1997 which addressed the potential impacts to the falcon of resuspension of contaminants during dredging. The assessment focuses on the effects arising from bioaccumulation and biomagnification, the potential pathways for uptake of contaminants, and their potential impacts on the peregrine falcon. The potential for substantial bioaccumulation in these species is not considered to be significant and it is unlikely that the proposed project will have a substantially adverse impact on the peregrine falcons in the area. In addition, the District will consult with the USFWS and coordinate with the USEPA and the Interagency Sediment Testing Team to evaluate the need for and design of a monitoring program which will fully evaluate the nature and extent of any outstanding concerns. Best management practices will be employed as appropriate to minimize resuspension in areas found to be contaminated. Removal of contaminated sediment during construction and maintenance dredging should serve to improve long-term water quality in the area in the future.

Sea turtles, including the threatened loggerhead, and endangered Kemp's Ridley, green, and leatherback, may occur in the upper New York Harbor area from spring to mid-fall. The District is coordinating with the NMFS regarding potential impacts to federally listed marine species and received their recommendations on December 23, 1996 (see Appendix D - Relevant Correspondence). As with the USFWS, coordination with the NMFS on compliance with the Endangered Species Act is intended to be ongoing for the life of the project.

5.2 Cultural Resources

Blasting is proposed in the vicinity of just four of the significant resources lining the Kill Van Kull. The property at 404 Richmond Terrace, the B&O Transfer Bridge and KVK Vessel 33 on Staten Island and Bayonne Vessel 36 on the New Jersey side of the waterway are within areas expected to experience a force of less than 0.5 PPV. The force of the proposed blasts in these areas will be limited and no impact to the resources is anticipated from project construction. The four historic properties will be surveyed before and after blasting and will be monitored with seismographs as blasting proceeds. Coordination with the New York and New Jersey Historic Preservation Offices is on-going.

5.3 Recreation

As noted in the FEIS and FSEIS, the project area is not significantly utilized for recreation. Impacts on recreation are expected to be positive with a resulting increase in boater safety.

5.4 Sediments

As noted in the FEIS, channel deepening will result in the temporary and localized resuspension and redistribution of sediments within the project area. That conclusion remains valid today. The project will also result in positive long-term benefits to the area by removing previously untouched material from the sideslopes of the Newark Bay and Kill Van Kull channels that are categorized as contaminated and unsuitable for ocean disposal. With removal from the project area, these contaminants would be excluded from potential impacts to the food chain. The sediment resuspended represents a very small portion of the material dredged and is only a short-term construction impact that will quickly settle. Before settling, a portion of the suspended material will be carried beyond the immediate project area. However, given the contaminated nature of the bay's overall sediments, no redistribution of contaminants to unaffected areas is likely.

As noted in the FSEIS (1987), there are substantial opportunities for habitat improvement with regard to the beneficial re-use of the large volume of rock proposed to be removed from the channels. As coordinated with the States of New York and New Jersey, rock material suitable for the placement at artificial reefs will be transported to appropriate locations to augment these structures or create new ones, as deemed appropriate by resource agencies. The remaining portion of the sediment suitable for ocean disposal will be placed at the HARS to remediate past impacts there in accordance with the management plan now being established by USEPA.

The New York District is presently conducting preliminary studies for the proposed deepening. This effort includes excavating six 50-feet by 50-feet areas (test digs) to evaluate whether dredging equipment has the capability to excavate in areas where rock had been fractured by Phase I construction. This could minimize or eliminate the need to conduct additional blasting.

The identification of a dredged material disposal site for the KVK/Newark Bay material is the responsibility of the non-federal sponsor. During the preparation of this EA, selection of a specific disposal site for sediment which may not be suitable for ocean disposal has not yet been finalized. The USACE in coordination with non-federal partners has identified and integrated a number of disposal strategies into an overall management plan. Two upland disposal sites have been identified by the non-federal sponsor for this project that have been proposed by private entities. In addition, the New York Harbor Dredged Material Management Plan (DMMP) (USACE, Interim Draft, September 1996) has identified other disposal opportunities which may

become available during the life of the project. Materials found to be unsuitable for ocean disposal will be tested using appropriate testing protocols and disposed of in a manner which has been subject to NEPA review.

5.5 Water Quality

Studies conducted since the FEIS and the FSEIS have demonstrated an overall improvement of water quality conditions within the project area. The impacts to water quality conditions from the authorized project are similar to those reported previously. As indicated in the SEIS (1986), a temporary increase in turbidity and concomitant decrease in DO can be expected to occur due to sediment resuspension from the dredging activities. However, due to the mixing currents, the large size of the project area, and the trend of increases in DO, it is anticipated that these impacts, while temporary and localized, will be less than anticipated in the FEIS.

The most commonly reported effect of dredging on water quality is an increase in turbidity and suspended solids. This impact is also minor, because it occurs in localized areas that motile organisms can avoid, and represents a condition that is a common occurrence in estuaries from winds, waves, and tidal scour and large sediment loads from freshwater flows. Motile organisms disturbed by the construction activities can be expected to migrate away from the area to return when more favorable conditions exist. In addition, dredging of sediments can result in the release of organic and inorganic materials, increasing oxygen demand, though the dynamic nature of the system coupled with its size relative to the area being dredged will minimize such impacts. Given the trend of increasing DO since 1968 within the project area (NYCDEP 1995) and no significant change in the flushing characteristics of the area caused by the project (Appendix B - Hydraulic Studies, SEIS, USACE 1986), there is little potential for anoxic conditions due to the construction of the project.

Best management practices will be employed during dredging in order to minimize disturbance and resuspension of solids in the water column. Removal of contaminated sediments during construction and maintenance dredging should serve to improve water quality in the future. In addition, vessel induced turbidity would be virtually eliminated, since only a few very large ships would approach bottom clearance. The District has initiated a water quality monitoring program as part of the biological monitoring program. The District will continue to coordinate with resource and regulatory agencies on results of the monitoring program.

5.6 Navigation

As concluded in the FEIS, marine traffic frequency reduction is a beneficial impact resulting from the project. An increase in depth to 45 feet will permit a more efficient use of vessels carrying cargo. Reduction in traffic will relieve congestion and minimize the likelihood of related accidents. Air pollution from vessels and vessel induced turbidity will decline markedly due to the reduction in marine traffic. The potential for marine accidents resulting in oil spills should also be reduced if the proposed project action is implemented. The deeper channel should eliminate most of the lightering which presently occurs in the anchorage areas.

5.7 Socio-Economic

As noted in the FEIS, deepening of the channels will provide positive benefits in terms of economic and maritime safety benefit to the region. Not acting and allowing siltation of the Kill

Van Kull and Newark Bay to continue, or continuing the current practice of port entry by depth-limited ships at high tide, would have a negative impact on the Port and the regional economy. Additionally, the no-action alternative would result in the potential diversion of progressively more shipping to another port, causing the reshipping of cargoes destined for the New York metropolitan area, which would have a negative impact on the area economy.

New York Harbor is naturally shallow. The limiting entrance depth, without deepening is approximately 19 feet. Since oil tankers, passenger liners, and containerships require depths of up to and exceeding 45 feet to transit the harbor, deepening and periodic maintenance dredging of harbor channels is essential for continued use of the Port. Should the harbor become impassable, consumer products would have to be brought to another port and subsequently transported to the New York metropolitan area. This additional cost to transport cargoes from another port to the area, which would be unnecessary if the Port remained accessible, is one category of the benefits dredging of the harbor yields.

A second such measure concerns tanker traffic. Currently, modern tankers with deep drafts are forced to lighter their cargoes in order to safely transit the Port's current navigation channels. The additional cost of lightering via barges that failure to dredge would necessitate is a measure of the benefits of dredging.

A third category of benefits of harbor dredging is derived from intra-harbor barge traffic. Without dredging, petroleum and petroleum products currently moved from one oil facility to another would require transportation by road, at higher costs than by water. The consequent increase in truck traffic would further clog already congested roads, increasing air pollution, noise and transit delays for all road traffic. Other vessels may also load light cargo or anchor in deeper water to await a favorable tide that would allow them to pass through a channel with otherwise inadequate clearance. Both these practices lead to congestion in anchorages and increase the risk of grounding, collisions or spills, with disastrous consequences to the estuary environment.

6.0 CONCLUSIONS

The New York District, Corps of Engineers is proposing the completion of the work authorized in 1985 for the improvements of the Kill Van Kull and Newark Bay channels (Figure 1). The work centers on improving navigation along the existing federal navigation channels. This EA addresses the final phase of deepening of the channels to their authorized depth. The Feasibility Report (1980), the FEIS (1980), the SEIS (1986), the GDM (1986), and the FSEIS (1987) and ROD which were developed previously form the basis upon which this re-evaluation is based. They are available in the District Office for review.

The project is authorized to -45 feet MLW and will require an additional 2-foot allowance for safety clearance and maintenance from the confluence of the Kill Van Kull and Anchorage Channels to the northern edge of the Port Newark Reach. This will approach or equal the depth of the Ambrose-Anchorage channel feeder arteries which connect the harbor with the Atlantic Ocean. This effort would reduce traffic and accidents, marine related air pollution would be reduced, bottom clearance would be at or near maximum and vessel induced turbidity would be virtually eliminated.

A review of studies conducted since the publications of the FEIS in 1980 and FSEIS in 1987 reveals the following changes in environmental conditions within the project area:

- Recent studies of the benthic communities within the project area have reached similar conclusions to those presented in the SEIS (USACE 1986). The Newark Bay benthic community exhibits relatively low species diversity and moderate to low abundance when compared to other portions of the harbor. Although the recent studies have reported on additional species that were not reported in the original work conducted for the FEIS and SEIS, the functional attributes of the community remain similar. Therefore, the impacts described in the original project documentation remain the same. The impacts will be temporary and recolonization of the disturbed areas will be rapid.

- Recent fisheries studies (e.g., NMFS 1995) have concluded that the channels are important habitat to fish species within the project area and are important habitat to overwintering blue crabs. The District will coordinate with the USFWS and NMFS to assess the need for including additional biological monitoring in order to determine appropriate measures to avoid adverse impacts to blue crabs and winter flounder as a result of construction activities.

- Currently, peregrine falcons are nesting on the Bayonne Bridge which spans the KVK as well as two bridges in the vicinity of the project site. Peregrine falcons were not nesting within the area at the time of the publication of the FEIS and FSEIS. The District has prepared and submitted to the USFWS on March 12, 1997 a Biological Assessment which examined the potential impacts to the falcons from the project. Based on the available information, contaminants expected, their likelihood of suspension, and potential for bioaccumulation and biomagnification, including information on prey species taken, it is unlikely that the proposed work would have a substantially adverse impact on the peregrine falcons in the area.

- Previously, unconsolidated sediments dredged from the project area were to be disposed of at the Mud Dump Site. Changes in dredged material testing protocols since the publication of the FEIS and FSEIS will likely result in a determination that a portion of the KVK/Newark Bay channel material is unsuitable for ocean disposal. In addition, the Mud Dump is scheduled to be closed in September 1997. Consequently, the District will utilize a site (or sites) that are approved through the DMMP process. All appropriate regulatory and permitting requirements (including NEPA, U.S. Fish and Wildlife Coordination Act, Endangered Species Act, National Historic Preservation Act, and State Water Quality and Coastal Zone Management regulations) for the actual disposal site or sites shall be met to ensure an opportunity for public review and comment prior to start of this project action. If a site does not become available, the start of this project may be delayed, or a separate SEIS for a new site will be prepared.

- Subsequent to the publication of the FSEIS, a number of vessels eligible or potentially eligible for the NRHP have been identified along the KVK shoreline. Coordination with the New Jersey and New York SHPOs will be undertaken, as in Phase I construction, to determine specific monitoring requirements during blasting. In addition, the District will conduct monitoring to ensure that there are no impacts to the B&O Transfer Bridge or historic vessels.

The District concludes that the above-described changes in conditions within the project area since the publication of the FEIS and FSEIS do not warrant preparation of an additional supplement to the EIS. The District also finds that the impacts associated with the authorized project are not significantly different from

those contained in the FEIS and FSEIS. The District is committed to working with the appropriate federal and state agencies to address additional monitoring requirements in order to avoid potential adverse impacts to the natural resources within the project area.

7.0 COORDINATION

The following agencies were contacted during the preparation of this assessment:

U.S. Environmental Protection Agency
- Marine and Wetlands Protection Branch
- Environmental Impacts Branch

National Marine Fisheries Service
New Jersey Department of Environmental Protection
- Division of Science and Research
- Bureau of Coastal Review

New York State Department of Environmental Conservation
New York State Department of State
United States Coast Guard
New York City Department of Environmental Protection

The District is coordinating with the NJDEP and NYSDEC on updating the Coastal Zone Management (CZM) consistency and Water Quality Certification for the project. The New Jersey and New York CZM Evaluations are included in Appendices E and F of this document. The Clean Water Act, Section 404(b)(1) Guidelines Evaluation is included in Appendix G. The NJDEP has issued a CZM consistency determination and Water Quality Certification for the proposed test digs within the project area. The District received comments to the Draft EA from the USEPA, NMFS, NJDEP, New York State Department of State, NYSDEC, and the Port Authority and prepared responses to these comments (Appendix H).

7.1 U.S. Environmental Protection Agency

The USEPA provided a response to the District on January 9, 1997 (Appendix D) which requested that the following items be discussed in the EA; purpose and need, disposal alternatives, potential environmental impacts, and commitment to apply for appropriate permits. The District submitted a response to the USEPA on January 17, 1997 stating that it intended to include the above items in the EA (Appendix D).

7.2 U.S. Fish & Wildlife Service

The USFWS submitted a draft Fish and Wildlife Coordination Act Section 2(b) Report dated December 6, 1996, to the District. The District submitted a response dated January 22, 1997, to the USFWS which contained two sections; one which responded to technical remarks in the main report and one which responded to the recommendations portion of the report (Appendix D). To address the USFWS concerns of the resuspension of contaminated sediments during dredging operations, the District will coordinate with the USEPA Interagency Sediment Testing Team to finalize a sampling design to evaluate the nature and extent of contamination within the project area. The USFWS recommended a survey of the project area for overwintering blue crabs and winter flounder. The USFWS submitted the final Fish and Wildlife Coordination Act Section 2(b) Report dated April 1997 to the District on April 21, 1997 (Appendix C). The District stated in its response that the NMFS (1995) study included recent information with regard to these

species. Also, the District will coordinate with the USFWS, NMFS, and appropriate state agencies to assess the need for including additional biological monitoring in order to determine appropriate measures to avoid adverse impacts to blue crabs and winter flounder as a result of construction activities. In addition, the District concurred with the USFWS that continued interagency coordination is necessary regarding appropriate measures to avoid adverse impacts to nesting water birds.

7.3 Other

The District is coordinating with the New Jersey Department of Environmental Protection and New York State Department of Environmental Conservation on Coastal Zone Management (CZM) consistency and Water Quality Certification for the project. The CZM evaluations for New Jersey and New York are included in Appendices E and F, respectively. A Section 404(b)(1) evaluation has been prepared by the District and is included in Appendix G.
Coordination with the New York and New Jersey State Historic Preservation Office's in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, will proceed when blasting plans are finalized.

For Information on this assessment please contact:

Jenine Gallo
Project Biologist
US Army Corps of Engineers
New York District, CENAN-PL-EA
26 Federal Plaza
New York, NY 10278-0090
(212)264-4549